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Docket: NRC-2018-0066

NUREG-2224, Dry Storage and Transportation of High Burnup Spent Nuclear Fuel, Draft Report for Comment.

Comment On: NRC-2018-0066-0001

Dry Storage and Transportation of High Burnup Spent Nuclear Fuel

Document: NRC-2018-0066-DRAFT-0012

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General Comment

Docket ID NRC-2018-0066-0001

NUREG 2224 is a strange 129 page mix of fact, fiction and fantasy. Less than 2 months to examine it is unfair. NRC should provide an extension.

Fuel and cladding are NOT like reinforced beams, as NRC fantasizes (p. 2-6), except that both have dissimilar materials which corrode/damage each other. On the contrary, heat and gases from the nuclear fuel puts pressure, especially hoop stress, on the cladding. Read, for instance, LANL documents about Plutonium (Pu) swelling with age, as it changes to Americium (Am).

Hydride defects canNOT count toward the thickness of the rod, as NRC pretends. This is dangerous NRC fantasy.

The fuel which the rod protects canNOT be considered part of the thickness, as NRC wants. This is absurd.

NRC canNOT allow for 50% cracks. This is criminal. Any crack can grow and split. Any defect can fail, especially under stress from gas pressure and transport.

Luppo et al. (2018) point out: "hydride reorientation (HR) and/or delayed hydride cracking (DHC), and blisters and rims formation are mechanisms of failure feasible to occur in spent fuel cladding (SFC) during dry storage. The HR phenomenon usually involves the dissolution of circumferential hydrides and the formation of zirconium hydrides oriented perpendicular to the hoop, hereby referred as radial hydrides. Hoop stresses are mainly produced by internal pressure of gasses." See Luppo et al. (2018): "Effect of blisters and

rims on radial hydride precipitation in fuel elements under dry storage conditions".

Length-wise hydrides, parallel to the length of the fuel rod (perpendicular to the circumference) are more likely to fail due to hoop stress, which is always the strongest direction of stress. Nonetheless, the hydride cracking appears somewhat random, so hoop stress and splitting open of fuel rods should be assumed.

Cranes fail so frequently that NRC has a document on it, so NRC needs to expect dropped SNF Casks. Due to defects from wear & tear, corrosion & hydride cracks-blisters, failure CAN occur with jiggling, despite NRC efforts to wish it away. NRC canNOT pretend that peak acceleration will be the same for one spent fuel rod as for a cask, as NRC apparently does.

The sister fuel rod project just started & will last 10 years. How can we comment before this info is in? And, it will not tell the status of the spent fuel in 20 years. And, it is only one fuel type. Areva's M5 cladding does not perform the same as Zircaloy or ZIRLO. They are all different materials. M5 fails in fewer cycles and at lower strain amplitude. Thus, assumptions canNOT be made based on one fuel type, as NRC suggests. If similar is the same, then NRC may have chimps working for them. Chimps are 98% the same as humans.

NRC allowed Holtec canister baskets kissing welds & other exemptions so fuel baskets are less likely intact. Use of aluminum, especially with less boron in the Metamic due to NRC exemptions, means that the baskets themselves may quickly degrade due to the so-called "lasagna cell" phenomena. Cesium exposed in broken fuel rods has behavior similar to salt, except stronger. Using Holtec-Areva canisters which cannot be opened means no one knows fuel rod condition. NRC has allowed exemptions for incorrectly packed Holtec canisters at more than one NPS site, adding to the dangers and unknowns.

Is this NUREG a case of too many cooks spoil the soup or an intentional mix meant to help those dealing with nuclear waste to justify their substandard cans? At the end the NRC conclusion appears to be anything goes, or as NRC's French friends say "n'importe quoi", if the utility or canister maker provide some sort of justification, however absurd. NRC provides some outlandish ideas to help with anything goes justification. NRC has outdone itself with some of the insane suggestions.

Holtec and Areva canisters are too thin and not fit for purpose. NRC must follow the law & only allow spent fuel canisters which allow for checking and retrievability without canister destruction. The Holtec and Areva canisters are welded shut, which provides more areas for material failure & cannot be opened or reclosed. Double bolted lids with pressure monitors between the lids (like Castor), as well as radiation detectors must be required, as must a much thicker canister. Casks should be stored in buildings which have filters & cameras & radiation monitors, as in some other countries. NRC must stop approving high burnup fuel & MOX & should shutdown nuclear reactors & focus on storing & monitoring waste properly.

Utilities escape \$ liability under Price Anderson but engineers are legally liable. Holtec engineers are temps so NRC will take the fall. The Nazis hunted & caught were not at the highest level. People will hunt you & bring you to justice even if you are elderly, when casks fail. You should go to the FBI and flip on the NRC for your own protection.